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DATA CENTER OPERATIONS BRANCH

NDS OPERATIONS PROCEDURE MANUAL
NO. P-D007

SYSTEM SW & HW
13 April 1983

DRUM COPY AND VERIFY

SYMBOLIC TITLE: N/A
PROGRAMMER:

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

TABLE OF CONTENTS

1. GENERAL 1-1
1.1.1. TRANSPARENT CONSOLE COMMANDS 1-1
1.1.2. JUMP KEYS 1-1
1.1.3. MASS STORAGE SAVE TAPE FORMAT 1-1
1.1.3.1. CONTROL WORDS ON THE DRUM SAVE TAPE 1-2
1.2. DRUM SAVE 1-2
1.2.1. MESSAGES AND RESPONSES 1-2
1.3. RESTORE ALL DRUMS SAVED 1-4
1.3.1. MESSAGES AND RESPONSES 1-4
1.3.2. EXEC SOFTWARE DRUM BOOT 1-4
1.3.2.1. MESSAGES AND RESPONSES 1-4
1.3.3. SOFTWARE TAPE BOOT 1-5
1.3.3.1. MESSAGES AND RESPONSES 1-5
1.4. DRUM SELECTIVE LOAD 1-6
1.4.1. MESSAGES AND RESPONSES 1-6
1.5. 5046 SAVE 1-6
1.5.1. MESSAGES AND RESPONSES 1-6
1.6. VERIFY SAVE TAPE TO MASS STORAGE 1-8
1.6.1. MESSAGES AND RESPONSES 1-8
1.7. TAPE COPY 1-9
1.7.1. MESSAGES AND RESPONSES 1-9
1.8. DOUBLE SAFE DRUM SAVE 1-10
1.8.1. MESSAGES AND RESPONSES 1-10
1.9. CSP LOADER 1-12
1.9.1. MESSAGES AND RESPONSES 1-12
1.10. CHANGING IOU/CHMOD/INTERFACE 1-13
1.10.1. MESSAGES AND RESPONSES 1-13
1.11. TAPE-PUR 1-13
1.11.1. TAPE-PUR INITIATION 1-13
1.11.1.1. HELP 1-13
1.11.1.2. @ASG 1-14
1.11.1.3. @COPY 1-14
1.11.1.4. @MOVE 1-14
1.11.1.5. @MARK 1-14
1.11.1.6. @REWIND 1-14
1.11.1.7. @CLOSE 1-15
1.11.1.8. @FREE 1-15
1.11.1.9. @RD 1-15
1.11.1.10. @RDF 1-15
1.11.1.11. @RDEOT 1-15
1.11.1.12. @W 1-15
1.11.1.13. @WR 1-15
1.11.1.14. @BS 1-16
1.11.1.15. @FS 1-16
1.11.1.16. NON-STOP TAPE COPY EXAMPLE 1-16

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

1. GENERAL

THIS OFFILNE UTILITY IS DESIGNED TO RUN IN AN OFF-LINE MODE ON ALL 1100 SYSTEMS (1108 THRU 1100/80). THIS RELEASE CONTAINS THE ABILITY TO SAVE AND RESTORE 432 AND 1782 DRUMS (ON 5012 CONTROLERS), VERIFY THE SAVE TAPE EQUALS THE DRUMS, COPY TAPE TO TAPE, AND LOAD CSP TEST PROGRAMS. THE TAPE HANDLER SUPPORTS 8C'S, U16'S, U20'S, AND U30-U36'S.

1.1.1. TRANSPARENT CONSOLE COMMANDS

WHEN ANY MESSAGE IS OUTSTANDING ON THE CONSOLE ANY OF THE FOLLOWING CONTROL COMMANDS CAN BE ISSUED.

```
**NOPR  TURNS OFF CONSOLE PRINT
**PRNT  TURNS ON CONSOLE PRINT
**REST  RESTART
**EIT   PRINTS EI TRACE TABLE
**CORE  TO INSPECT AND CHANGE CORE (END OR EXIT TO CONTINUE)
**SNAP  SNAP MEMORY OR GRS (**SNAP SIZE,START)
**SRB   SET 'R' BIT ON TAPE SET MODE COMMANDS (MSA'S)
**CRB   CLEAR 'R' BIT ON TAPE MODE SET COMMANDS (MSA'S)
**U100  SETS BOTTOM OF SCREEN TO LINE 16 (NON80)
**U200  SETS BOTTOM OF SCREEN TO LINE 24 (NON80)
**DUAL  SELECT TAPE WRITE CHANNEL FOR ASG,W (**DUAL XX)
        (FOR 80 AND 60 **DUAL IOU/CM)
```

1.1.2. JUMP KEYS

```
JUMP 1 - SHORT CUT TO ANSWER 5 (DOUBLE SAFE DRUM SAVE)
JUMP 2 - MULTI HOST USING ONE TAPE CONTROL UNIT (DEBUGG)
         AND 5046 SNAPS ETC
JUMP 3 - MULTI HOST USING ONE TAPE CONTROL UNIT (DEBUGG)
JUMP 4 - PUT CONSOLE EI'S IN EI TRACE TABLE (DEBUGG 80)
JUMP 7 - AVOIDS REWINDING TAPE TO INTERLOCK
JUMP 9 - ASKS FOR TAPE DENSITY ON OUTPUT TAPES (9TK VIA MSA ONLY)
JUMP 10- ALLOWS THE DUMP TO OPERATE LIKE A MASTER TAPE
JUMP 14- CONSOLE PRINTS A HARD COPY ON ALL MSGS
JUMP 15- OMIT CONSOLE PRINTER OUTPUT
```

1.1.3. MASS STORAGE SAVE TAPE FORMAT

THE FIRST FOUR WORDS OF EACH BLOCK ARE USED FOR CONTROL AND CHECK INFORMATION. THE NEXT REST OF THE BLOCK IS DATA FROM THE DRUM.

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

DRUM UNITS ARE SAVED ONE UNIT PER FILE ON THE TAPE. TAPE SWAP IS DONE WHEN END OF TAPE IS RECIVED AND THE SAVE OPERATION HAS NOT YET COMPLETED. BLOCK SEQUENCE NUMBERS CONTINUE ACCROSS TAPES WHEN TAPE SWAP IS REQUIRED.

1.1.3.1. CONTROL WORDS ON THE DRUM SAVE TAPE

```
        WORD 0 = DRUM ADDRESS
        WORD 1,S1 = DRUM CHANNEL (NON 80'S)
        WORD 1,S2 = UNIT TABLE INDEX (NON 80'S)
        WORD 1,H1 = WORD MASS STORAGE PATH 1100/80 (IOU/CM/DEVA)
        WORD 1,H2 = TAPE BLOCK COUNT
        WORD 2 = STARTING ADDRESS OF THE UNIT
        WORD 3 = ENDING ADDRESS -02000 OF THE UNIT
         WORD  4   =  FIRST OF 02000 DATA WORDS FROM DRUM OR 03400
FROM DISK
        TSWAP TAPE BUFFER ( 16 WORDS )
        WORD 0 = '$SWAP$'
        WORD 1 = BLOCK # OF LAST DATA BLOCK
```

1.2. DRUM SAVE

THE DRUM SAVE COPIES THE CONTENTS OF 432/1782 DRUMS TO TAPE. THE BOOT MUST BE FROM A MASTER OFF LINE UTILITY TAPE.

1.2.1. MESSAGES AND RESPONSES

```
        LOAD OUTPUT ON BOOT SS UNIT '06' IF REQUIRED
        1-DRUM SAVE, 2-5046 SAVE, 3-TAPE COPY, 4-CSPLOAD
        5-DRUM SAVE 2 COPYS, 6-TAPE/PUR, 7-SITE DRUMS
        SELECT TASK 1,2,3,4,5,6,7
        KEYIN=1
        ENTER DRUM PATH  IOU/CHMOD/INTERFACE
        IOU=0-3, CM=0-7, INTERFACE=A,B,C,D
        KEYIN=2/5/B
        ARE 432 DRUMS FIRST ? 'Y','N'
        KEYIN=N  (NO 432'S ARE CONFIGURED)
        ENTER 1782 DRUM UNITS 'X,X,X,X' OR 'N'
        KEYIN=1,0  (UP TO 8 UNITS MAY BE SOLLECTED)
        (AT THIS POINT THE DUMP WILL TAKE PLACE)
        DRUM DUMP COMPLETE AS SPECIFIED
        CURRENT OPERATION IS COMPLETE. ANSWER THE NEXT MSG
        ONLY IF ANOTHER OPERATION IS DESIRED.
        1 - MASS STORAGE SAVE OR TAPE COPY
```

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

2 - VERIFY TAPE = MASS STORAGE OR RESTORE MASS STORAGE
3 - EXEC DRUM BOOT FROM DRUM UNIT 0 (SOFTWARE BOOT)
4 - SOFTWARE TAPE BOOT
ANSWER 1,2,3,4
(SEE 1.3.2 AND 1.3.3)

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

1.3. RESTORE ALL DRUMS SAVED

THE DRUM FULL RESTORE LOADS ALL DRUMS THAT HAVE BEEN SAVED ON THE SAVE TAPE. THE TAPE HAS THE DRUM CHANNEL AND DRUM ADDRESS THE DATA CAME FROM AND THE TAPE LOAD RESTORES THE DATA TO THE LOCATION ON THE DRUM IT CAME FROM. TAPE PARITY , BLOCK SIZE AND BLOCK SEQUENCE ARE CHECKED. THE OPERATOR IS GIVEN THE OPTION TO CONTINUE OR RETRY ON MOST ERRORS IF DESIRED. THE BOOT TAPE MUST BE THE SAVE TAPE.

1.3.1. MESSAGES AND RESPONSES

```
FULL OR SELECTIVE LOAD, VERIFY OR NEW -- 'F,S,V,N'
KEYIN=F
LOADING ENTIRE CONTENTS FROM TAPE TO DRUM  'Y'
KEYIN=Y (A LAST MSG BEFORE WRITING TAPE TO DRUM)
TAPE TO DRUM COMPLETE
CURRENT OPERATION IS COMPLETE. ANSWER THE NEXT MSG
ONLY IF ANOTHER OPERATION IS DESIRED.
1 - MASS STORAGE SAVE OR TAPE COPY
2 - VERIFY TAPE = MASS STORAGE OR RESTORE MASS STORAGE
3 - EXEC DRUM BOOT FROM DRUM UNIT 0 (SOFTWARE BOOT)
4 - SOFTWARE TAPE BOOT
ANSWER  1,2,3,4
(SEE 1.3.2 AND 1.3.3)
```

1.3.2. EXEC SOFTWARE DRUM BOOT

THE SOFTWARE DRUM BOOT FIRST READS DRUM UNIT 0 ON THE CHANNEL PREVOUSALLY SOLLECTED FOR THE DRUM LOAD OR SAVE INTO A SCRATCH BUFFER AND CHECKS SEVERAL LOCATIONS TO DETERMINE IF THAT IS THE EXEC BOOT BLOCK. IF SO THE FIRST 02000 WORDS WILL BE READ AGAIN, BUT THIS TIME THE UTILITY WILL BE OVERLAYED.

1.3.2.1. MESSAGES AND RESPONSES

```
CURRENT OPERATION IS COMPLETE. ANSWER THE NEXT MSG
ONLY IF ANOTHER OPERATION IS DESIRED.
1 - MASS STORAGE SAVE OR TAPE COPY
2 - VERIFY TAPE = MASS STORAGE OR RESTORE MASS STORAGE
3 - EXEC DRUM BOOT FROM DRUM UNIT 0 (SOFTWARE BOOT)
4 - SOFTWARE TAPE BOOT
ANSWER 1,2,3,4
KEYIN=3
```

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3


```
NOTE: TO BOOT EXEC OTHER CAU'S MUST HAVE MSR SET
JUMPS SET 15, ANS GO
KEYIN=GO
(EXEC MESSAGES WILL FOLLOW)
```

1.3.3. SOFTWARE TAPE BOOT

THE SOFTWARE TAPE BOOT ALLOWS A TAPE ON ANY UNIT OF THE ACTIVE TAPE CHANNEL TO BE SOFTWARE BOOTED, AFTER FIRST READING THE TAPE INTO A SCRATCH BUFFER TO DETERMINE IF IT IS A POSSIBLE BOOT BLOCK BEFORE DOING THE OVERLAY.

1.3.3.1. MESSAGES AND RESPONSES

```
CURRENT OPERATION IS COMPLETE. ANSWER THE NEXT MSG
ONLY IF ANOTHER OPERATION IS DESIRED.
1 - MASS STORAGE SAVE OR TAPE COPY
2 - VERIFY TAPE = MASS STORAGE OR RESTORE MASS STORAGE
3 - EXEC DRUM BOOT FROM DRUM UNIT 0 (SOFTWARE BOOT)
4 - SOFTWARE TAPE BOOT
ANSWER 1,2,3,4
KEYIN=4
WHEN INPUT IS ON C13/UC5 ANS GO OR UNIT 'XX'
KEYIN=GO
NOTE: TO BOOT EXEC OTHER CAU'S MUST HAVE MSR SET
JUMPS SET 4,13,15, ANS GO
KEYIN=GO
(OFFLINE UTILITY IS OVERLAYED AT THIS POINT)
```

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

1.4. DRUM SELECTIVE LOAD

THE SELECTIVE LOAD IS USED TO RESTORE SELECTED UNITS FROM THE DRUM SAVE TAPE. UNITS MAY BE SOLECTED IN ANY ORDER AS LONG AS THEY ARE ON THE SAVE TAPE, BUT WILL BE RELOADED IN THE ORDER THEY APPEAR ON THE TAPE. THE TAPE BOOTED MUST BE THE SAVE TAPE.

1.4.1. MESSAGES AND RESPONSES

```
FULL OR SELECTIVE LOAD, VERIFY OR NEW - 'F,S,V,N'
KEYIN=S
SELECTIVE DRUM RELOAD CH01
ENTER 432 UNITS 'X,X,X,X' OR N
KEYIN=1,3
ENTER 1782 UNITS 'X,X,X,X' OR N
KEYIN=3
TAPE TO DRUM COMPLETE
CURRENT OPERATION IS COMPLETE. ANSWER THE NEXT MSG
ONLY IF ANOTHER OPERATION IS DESIRED.
1 - MASS STORAGE SAVE OR TAPE COPY
2 - VERIFY TAPE = MASS STORAGE OR RESTORE MASS STORAGE
3 - EXEC DRUM BOOT FROM DRUM UNIT 0 (SOFTWARE BOOT)
4 - SOFTWARE TAPE BOOT
ANSWER 1,2,3,4
(SEE 1.3.2 AND 1.3.3)
```

1.5. 5046 SAVE

THE 5046 SAVE COPIES THE CONTENTS OF 8450/8434 DISK TO TAPE. JUMP KEY 2 SNAPS PART OF THE HARDWARE AND SOFTWARE BIT MAPS, THE VOL1 LABLE BLOCK ETC. NOTE THAT THE 5046 DISK SAVE AND RESTORE HAS NOT BEEN DEBUGGED FULLY. TRY THIS ONLY IF YOU CAN AFFORD TO LOSE THE PACK. THE BOOT MUST BE FROM A MASTER OFF LINE UTILITY TAPE.

1.5.1. MESSAGES AND RESPONSES

```
LOAD OUTPUT ON BOOT SS UNIT '06' IF REQUIRED
1-DRUM SAVE, 2-5046 SAVE, 3-TAPE COPY, 4-CSPLOAD
5-DRUM SAVE 2 COPYS, 6-TAPE/PUR, 7-SITE DRUMS
SELECT TASK 1,2,3,4,5,6,7
KEYIN=2
DISK SAVE IS IN DEBUGG STAGE
1-SAVE ALL TKS  2-SAVE ASGD TKS  ANS 1,2
```

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3


```
(NOTE: I CAN'T SEE ANY REASON TO DUMP UNUSED TRACKS)
INSERT 5046 CHANNEL 'XX' IN DECIMAL (EXAMPLE 08)
KEYIN=01
ENTER 5046/8450 DISK UNIT NUMBER 'XX'
KEYIN=01
PACK ID = XXXXXX
(AT THIS POINT THE DUMP WILL TAKE PLACE)
5046 DUMP COMPLETE AS SPECIFIED
CURRENT OPERATION IS COMPLETE. ANSWER THE NEXT MSG
ONLY IF ANOTHER OPERATION IS DESIRED.
1 - MASS STORAGE SAVE OR TAPE COPY
2 - VERIFY TAPE = MASS STORAGE OR RESTORE MASS STORAGE
3 - EXEC DRUM BOOT FROM DRUM UNIT 0 (SOFTWARE BOOT)
4 - SOFTWARE TAPE BOOT
ANSWER 1,2,3,4
(SEE 1.3.2 AND 1.3.3)
```

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

1.6. VERIFY SAVE TAPE TO MASS STORAGE

COMPARE THE CONTENTS OF THE SAVE TAPE TO THE DRUMS TO VERIFY THE SAVE TAPE IS A GOOD COPY OF THE CONTENTS OF THE DRUMS AND TO INSURE THE TAPE CAN BE READ. THE TAPE BOOTED MUST BE THE SAVE TAPE.

1.6.1. MESSAGES AND RESPONSES

```
FULL OR SELECTIVE LOAD, VERIFY OR NEW - 'F,S,V,N'
KEYIN=V
VERIFY TAPE = DRUM
DRUM ADDRESSES 000010000000 - 000017777777 COMPARE OK
DRUM ADDRESSES 000000000000 - 000007777777 COMPARE OK
TAPE COMPARE COMPLETE
CURRENT OPERATION IS COMPLETE. ANSWER THE NEXT MSG
ONLY IF ANOTHER OPERATION IS DESIRED.
1 - MASS STORAGE SAVE OR TAPE COPY
2 - VERIFY TAPE = MASS STORAGE OR RESTORE MASS STORAGE
3 - EXEC DRUM BOOT FROM DRUM UNIT 0 (SOFTWARE BOOT)
4 - SOFTWARE TAPE BOOT
ANSWER 1,2,3,4
(SEE 1.3.2 AND 1.3.3)
```

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

1.7. TAPE COPY

COPY ANY INPUT TAPE TO ANY OUTPUT TAPE UNIT ON THE BOOT CHANNEL. THE OUTPUT TAPE WILL BE AT THE HIGHEST DENSITY THE OUTPUT UNIT IS CAPABLE OF. IF LESSER DENSITY IS DESIRED JUMP 9 MAY BE USED ON NINE TRACK TAPE UNITS TO ENTER DENSITY. THE BOOT MUST BE FROM A MASTER OFF LINE UTILITY TAPE.

1.7.1. MESSAGES AND RESPONSES

LOAD OUTPUT ON BOOT SS UNIT '06' IF REQUIRED
1-DRUM SAVE, 2-5046 SAVE, 3-TAPE COPY, 4-CSP LOAD
5-DRUM SAVE 2 COPYS, 6-TAPE/PUR, 7-SITE DRUMS
SELECT TASK 1,2,3,4,5,6,7
KEYIN=3
SERVICE C13/U06 OUTPUT TAPE (AN INTERRUPT FROM THE CONSOLE WILL ALLOW THE OPERATOR TO CHANGE TAPE UNITS IF HE SO DESIRES)
CHANGE OUTPUT TAPE UNIT ? ANS 'XX' OR 'N'
KEYIN=07
SERVICE S13/U07 OUTPUT TAPE
WHEN INPUT TAPE IS ON C13/U05 ANS GO OR UNIT 'XX'
KEYIN=GO
COPY TO DOUBLE EOF'S COMPLETE
CURRENT OPERATION IS COMPLETE. ANSWER THE NEXT MSG ONLY IF ANOTHER OPERATION IS DESIRED.
1 - MASS STORAGE SAVE OR TAPE COPY
2 - VERIFY TAPE = MASS STORAGE OR RESTORE MASS STORAGE
4 - SOFTWARE TAPE BOOT
ANSWER 1,2,3,4 (NOTE: 3 IS NOT ALLOWED)
(SEE 1.3.2 AND 1.3.3)

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

1.8. DOUBLE SAFE DRUM SAVE

THIS DUMPS DRUMS TO TAPE , COPIES THE TAPE AND VERIFIES THE TAPE TO DRUM. MINIMUM OPERATOR INTERVENTION IS REQUIRED. BOOTING THE MASTER TAPE WITH JUMP 1 SET ACTIVATES THIS MODE OR WHEN NO JUMPS ARE SET ANSWER 5 TO THE FIRST MESSAGE THAT REQUIRES A RESPONSE. BLANKS ARE REQUIRED TO BE ON BOOT UNIT +1 AND +2. THE BOOT MUST BE FROM A MASTER OFF LINE UTILITY TAPE.

NOTE: TAPE SWAP IS NOT SUPPORTED IN THIS MODE

1.8.1. MESSAGES AND RESPONSES

```
LOAD OUTPUT ON BOOT SS UNIT '06' IF REQUIRED
1-DRUM SAVE, 2-5046 SAVE, 3-TAPE COPY, 4-CSPLOAD
5-DRUM SAVE 2 COPYS, 6-TAPE/PUR, 7-SITE DRUMS
SELECT TASK 1,2,3,4,5,6,7
KEYIN=5
SPECIAL DRUM SAVE , COPY AND VERIFY
MOUNT BLANK TAPES ON BOOT UNIT +1 AND +2
INSERT DRUM CHANNEL 'XX' IN DECIMAL (EXAMPLE 08)
KEYIN=01
ARE 432 DRUMS FIRST ? 'Y','N'
KEYIN=N  (UNIT 0 WAS A 1782)
ENTER 1782 DRUM UNITS 'X,X,X,X' OR 'N'
KEYIN=1,0  (UP TO 8 UNITS MAY BE SOLLECTED)
(AT THIS POINT THE DUMP WILL TAKE PLACE)
DRUM DUMP COMPLETE AS SPECIFIED
LOAD OUTPUT TAPE ON BOOT SS UNIT '07' (BLANK)
WHEN INPUT IS ON C13/U06  ANS GO OR UNIT 'XX'
PSEUDO KEYIN =GO
EOF001
EOF002
EOF003
COPY TO DOUBLE EOF'S COMPLETE
WHEN INPUT IS ON C13/U07  ANS GO OR UNIT 'XX'
PSEUDO KEYIN =GO
VERIFY TAPE = MASS STORAGE
DRUM ADDRESSES 000010000000 - 000017777777 COMPARE OK
DRUM ADDRESSES 000000000000 - 000007777777 COMPARE OK
TAPE COMPARE COMPLETE
CURRENT OPERATION IS COMPLETE. ANSWER THE NEXT MSG
ONLY IF ANOTHER OPERATION IS DESIRED.
1 - MASS STORAGE SAVE OR TAPE COPY
2 - VERIFY TAPE = MASS STORAGE OR RESTORE MASS STORAGE
3 - EXEC DRUM BOOT FROM DRUM UNIT 0 (SOFTWARE BOOT)
4 - SOFTWARE TAPE BOOT
ANSWER 1,2,3,4
```

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

(SEE 1.3.2 AND 1.3.3)

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

1.9. CSP LOADER

THE CSP LOADER LOADS TEST PROGRAMS INTO THE 1100 HOST MEMORY AND SENDS THEM TO A CSP AFTER RECEIVING AN IPL. ONLY ONE CSP PROGRAM IS LOADED INTO THE HOST AT ANY ONE TIME. CSP PROGRAMS IN THE HOST CAN BE OVERLAYED FROM THE MASTER TAPE VIA A COMMAND FROM THE OPERATORS CONSOLE.

1.9.1. MESSAGES AND RESPONSES

```
        LOAD OUTPUT ON BOOT SS UNIT '06' IF REQUIRED
        1-DRUM SAVE, 2-5046 SAVE, 3-TAPE COPY, 4-CSPLOAD
        5-DRUM SAVE 2 COPYS, 6-TAPE/PUR, 7-SITE DRUMS
        SELECT TASK 1,2,3,4,5,6,7
        KEYIN=4
        CSP LOAD NUMBERS FOLLOW
        PRELUDE      LOAD  01
        MINI-ICA     LOAD  02
        CSP-0770     LOAD  03
        CSP          LOAD  04
        ICA          LOAD  05
        S7026        LOAD  06
        S7010        LOAD  07
        CSPRCR       LOAD  08
        CSPRCR-NSA   LOAD  09
        CSPRCR-NASA  LOAD  10
        CSPRCR-TRES  LOAD  11
        CPC          LOAD  12
        MUXOFF       LOAD  13
        RDROFF       LOAD  14
        PCHOFF       LOAD  15
        PRT768D      LOAD  16
        PRT7682      LOAD  17
        PRT770       LOAD  18
  (HOST WAITS FOR A CONSOLE INTERRUPT)
        ENTER LOAD NUMBER,HELP,INIT,NO 'XX',H,I,N
        KEYIN=01
        PRELUDE      LOADED
        PRELUDE      IPL
        PRELUDE      IPL
        ENTER LOAD NUMBER ,HELP ,INIT ,NO  'XX',H,I,N
        KEYIN=03
        CSP-0770     LOADED
```

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

1.10. CHANGING IOU/CHMOD/INTERFACE

ALLOWS THE USER TO CHANGE EITHER THE IOU, CHANNEL MODULE, OR THE INTERFACE FOR A DRUM RESTORE OR VERIFY. THE TAPE BOOTED MUST BE THE SAVE TAPE.

1.10.1. MESSAGES AND RESPONSES

```
FULL OR SELECTIVE LOAD, VERIFY OR NEW - 'F,S,V,N'
KEYIN=N
ENTER DRUM PATH  IOU/CHMOD/INTERFACE
IOU=0-3, CM=0-7, INTERFACE=A,B,C,D
KEYIN=2/6/8
FULL OR SELECTIVE LOAD, VERIFY OR NEW - 'F,S,V,N'
** AT THIS POINT THE USER DECIDES ON WHAT OTHER **
** FUNCTION TO PERFORM ( 'F,S,V' )               **
```

1.11. TAPE-PUR

TAPE-PUR INCORPERATES MANY FIR-PUR TAPE COMMANDS. IT ALLOWS THE USER TO DO TAPE OPERATIONS OFF-LINE FROM THE CONSOLE SUCH AS @ASG , @COPY , @MOVE , @MARK ETC. THE MAX BLOCK SIZE FOR TAPE COPYS IS 030000 WORDS.

1.11.1. TAPE-PUR INITIATION

```
LOAD OUTPUT ON BOOT SS UNIT '06' IF REQUIRED
1-DRUM SAVE, 2-5046 SAVE, 3-TAPE COPY, 4-CSPLOAD
5-DRUM SAVE 2 COPYS, 6-TAPE/PUR, 7-SITE DRUMS
SELECT TASK 1,2,3,4,5,6,7
KEYIN=6
ENTER CMD OR HELP
```

SUPPORTED COMMANDS ARE @ASG , @COPY , @MOVE , @MARK , @REWIND @FREE , @CLOSE , @RD , @RDF , @RDEOT , @BS , @FS , HELP.

1.11.1.1. HELP

```
KEYIN=HELP
DISPLAYS BRIEF OPERATING INSTRUCTIONS
```

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

1.11.1.2. @ASG

```
        KEYIN=@ASG  T1,U9V,3
  @ASG ASSIGN A TAPE (@ASG,W TO ASSIGN A BLANK TAPE). T1=TAPE FILE
NAME. NAMES AVAILABLE ARE T1,T2,T3,T4,T5,T6,IN,OUT. U9V = DENSITY
AT  1600. MOST DENSITY'S ARE SUPPORTED. 3 = UNIT THREE.  TO SELECT
FORMATS ASSIGN OPTIONS Q,A,B,C ARE SUPPORTED.  (OPTIONS  A  AND  Q
SELECT QW MODE). TO ASSIGN A TAPE AS OUTPUT IN A FORMAT (QW MODW)
THE ASSIGN = @ASG,AW T1,U9V,2 .

        ASG OPTOPNS
        A - TAPE TO USE 'A' FORMAT
        B - TAPE TO USE 'B' FORMAT
        C - TAPE TO USE 'C' FORMAT
        J - ASSUMED , NO LABELS
        Q - QUARTER WD MODE (THE SAME AS A OPTION)
        T - ASSUMED TEMPORARY
        W - OUTPUT TAPE WRITES TO VALIDATE DENSITY. TAKES IO
            CHANNEL FROM THE **DUAL COMMAND.
```

1.11.1.3. @COPY

```
        KEYIN=@COPY T1,T2,26
 T1=INPUT TAPE , T2=OUTPUT TAPE , 26=FILES TO COPY.
```

1.11.1.4. @MOVE

```
        KEYIN=@MOVE,B  T6,3
  MOVE TAPE T6 BACK 3 FILES.
```

1.11.1.5. @MARK

```
        KEYIN=@MARK  T4
  WRITE TWO EOF'S , BACKSPACE OVER ONE.
```

1.11.1.6. @REWIND

```
        KEYIN=@REWIND  T1
  REWIND TAPE T1 TO LOADPOINT
        KEYIN=@REWIND,I  T1
  REWIND TAPE T1 TO INTERLOCK.
```

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

1.11.1.7. @CLOSE

KEYIN=@CLOSE T1
WRITE TWO FILE MARKS AND REWIND TAPE T1 TO LOADPOINT.

1.11.1.8. @FREE

KEYIN=@FREE T2
REWINDS TAPE T2 TO INTERLOCK AND FREES UNIT STATUS TABLE.

1.11.1.9. @RD

KEYIN=@RD T1
READ TAPE T1 FARWARD ONE BLOCK.

1.11.1.10. @RDF

KEYIN=@RDF T1
READ TAPE T1 FARWARD UNTIL AND EOF IS DETECTED.

1.11.1.11. @RDEOT

KEYIN=@RDEOT T1
READ TAPE T1 FARWARD UNTIL AND TWO EOF'S ARE DETECTED CONSECUTIVELY.

1.11.1.12. @W

KEYIN=@W T1
WRITE ONE BLOCK ON TAPE T1.

1.11.1.13. @WR

KEYIN=@WR T1
WRITE TAPE T1 UNTIL MSG WAITING ON CONSOLE OR END OF TAPE IS ENCOUNTERED. IN EITHER CASE TWO END OF FILES ARE WRITTEN AND THE TAPE IS BACK SPACED OVER THE LAST FILE MARK.

Approved For Release 2008/03/13 : CIA-RDP94T00858R000601180001-3

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1.11.1.14. @BS

```
KEYIN=@BS  T4
BACKSPACE TAPE T4 ONE BLOCK.
```

1.11.1.15. @FS

```
KEYIN=@FS  T4
FORWARD SPACE TAPE T4 ONE BLOCK.
```

1.11.1.16. NON-STOP TAPE COPY EXAMPLE

```
**DUAL 12 (NON 80 WRITE ON CH 12. (@ASG,W))
@ASG,Q T1,U9H,2  (USES BOOT CHANNEL QW MODE)
@ASG,WQ T2,U9S,3  (USES CHANNEL FROM **DUAL IN QW MODE)
@COPY T1,T2,99
```

IF THE BOOT CHANNEL AND THE CHANNEL ENTERED VIA **DUAL COMMAND ARE NOT EQUAL, DOUBLE BUFFERING AND OVERLAPING IO WILL TAKE PLACE. THE INPUT TAPE T1 WAS ASSIGNED AT 800 PPI AND THE OUTPUT T2 WAS ASSIGNED AT 6250. CHANCES ARE NON-STOP OPERATION WILL OCCUR ON THE INPUT TAPE T1. IF BOTH TAPES WERE THE SAME DENSITY NEAR NON-STOP MAY BE OBTAINED ON BOTH UNITS.

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